

What Is Claim d:

1. A beam cast of aluminum-magnesium (Al-Mg) alloy for mounting components adjacent to a cowl/plenum structure at the forward end of a passenger compartment in an automotive vehicle, the beam comprising:

5 a laterally extending main beam portion of Al-Mg alloy having a first end for fastening directly to a driver side front pillar of the vehicle and a second end for fastening directly to a passenger side front pillar of the vehicle;

a plurality of spaced strap portions cast of Al-Mg alloy unitarily with the main beam portion, the strap portions extending forward from the main beam portion for attachment to the cowl/plenum structure of the automotive vehicle,
10 and

a pair of substantially vertical strut portions cast of Al-Mg alloy unitarily with the main beam portion, the substantially vertical strut portions having a space therebetween for accommodating HVAC components and having lower
15 ends adapted to attach to vertical steel struts to anchor the lower ends of the strut portions to a floor brace.

2. The beam of claim 1 wherein the main beam portion has first, second, third and fourth sections;

20 the first section extending from the first end of the main beam portion to a location from which a first strap portion extends;

the second section extending between the first strap portion and a second strap portion, the second portion having flanges thereon for supporting a steering column;

the third section extending from the second strap portion to a third strap portion, the third section having an opening for receiving HVAC module therethrough with the vertical strut portions extending downwardly therefrom, and

the fourth section extending from the third strap portion to the second end
5 of the main beam portion, the fourth section adapted to accommodate a passenger air bag mounting bracket thereabove and an instrument panel trim support therebelow.

3. The beam of claim 2 wherein the first section of the beam extends
10 obliquely from the second section in a direction toward the cowl/plenum structure.

4. The beam of claim 1 wherein the main beam portion has a front side adapted to face forward away from the passenger cabin and a rear side adapted
15 to face rearward toward the passenger compartment, the front side having an array of cast cross braces within a cavity in the front side.

5. The beam of claim 1 wherein the vertical strut portions each have a rearwardly opening cavity with cast cross braces in the rearwardly facing cavities.

20

6. The beam of claim 2 wherein the third section has a panel portion extending downwardly therefrom with the vertical strut portions depending downwardly from the panel portion.

7. The beam of claim 2 wherein the fourth section of the beam has a top surface which extends at a level below the first, second and third sections.

8. The beam of claim 1 wherein the first and second ends include flanges
5 having bolt holes therethrough adapted to receive bolts for securing the beam to the side pillars.

9. The beam of claim 1 wherein the strap portions have vertically offset end tabs with bolt holes therethrough for attaching the beam to the cowl/plenum
10 structure of the automotive vehicle.

10. A passenger compartment of an automotive vehicle, including a beam cast of aluminum-magnesium (Al-Mg) alloy for mounting components adjacent to a cowl/plenum structure at the forward end of the passenger compartment, the
15 beam comprising:

a laterally extending main beam portion of Al-Mg alloy having a first end for fastening directly to a driver side front pillar of the passenger compartment and a second end for fastening directly to a passenger side front pillar of the passenger compartment;

20 a plurality of spaced strap portions cast of Al-Mg alloy unitary with the main beam portion, the strap portions extending forward from the main beam portion for attachment to the cowl/plenum structure of the automotive vehicle, and

a pair of vertical strut portions cast of Al-Mg alloy unitary with the main beam portion, the vertical strut portions having a space therebetween for accommodating HVAC components and having lower ends attached to vertical steel struts to anchor in the passenger compartment the lower ends of the strut portions to a floor brace, the vertical strut portions cooperating with the strap portions to dampen frequency response in the main beam portion.

11. The passenger compartment of claim 10 wherein the main beam portion has first, second, third and fourth sections;

10 the first section of the main beam portion extending from the driver side pillar to a location from which a first strap portion extends;

the second section extending between the first strap portion and a second strap portion, the second portion having flanges thereon for supporting a steering column projecting into the passenger compartment;

15 the third section extending from the second strap portion to a third strap portion, the third section having an opening for receiving an HVAC module therethrough for access to and from the passenger compartment with the vertical strut portions extending downwardly therefrom, and

the fourth section extending from the third strap portion to the second end
20 of the main beam portion, the fourth section adapted to accommodate a passenger air bag mounting bracket thereabove and the instrument panel trim therebelow.

12. The passenger compartment of claim 11 wherein the main beam portion has a front side adapted to face forward away from the passenger cabin and a rear side adapted to face rearwardly into the passenger compartment, the front side having an array of cast cross braces within a cavity in the front side.

5